Schedule

Week 1 (09/07-9/11)

- Day 1
  - Introduction to Theory of Computation[1]
  - Introduction to OCAML[2]
  - Assignment 1[3]
- Day 2
  - OCAML basics[4]
- Day 3
  - OCAML basics (cont)[5]
- Day 4
  - OCAML basics (cont)[6]
  - OCAML example: sets as lists (optional)[7]

Week 2 (09/14-09/18)

- Day 1
  - Alphabets, strings, substrings, empty string, lexicographic ordering[8]
  - Alphabet and friends in OCAML[9]
  - Assignment 2[10]
- Day 2
  - Languages, examples, constructions[11]
- Day 3
  - Languages, examples, constructions[12]
- Day 4
  - Deterministic Finite Automata[13]

[1] notes/theory_intro.html
[2] notes/ocaml_intro.html
[3] assignments/1.html
[4] notes/ocaml_basics.html
[5] notes/ocaml_basics.html
[6] notes/ocaml_basics.html
[7] notes/ocaml_sets.html
[8] notes/alphabet.html
[9] notes/ocaml_alphabet.html
[10] assignments/2.html
[11] notes/languages.html
[12] notes/languages.html
[13] notes/fin_aut_dfa.html

Week 3 (09/21-09/25)

- Day 1
  - Deterministic Finite Automata (cont)[14]
- Day 2
  - DFAs in OCAML[15]
- Day 3
  - Regular Languages[16]
  - Union of regular languages is regular[17]
- Day 4
  - Implementation of union in OCAML[18]
  - Assignment 3[19]

Week 4 (09/28-10/02)

- Day 1
  - Non-deterministic automata, examples[20]
  - Implementation in OCAML
- Day 2
  - DFA equivalent to an NFA[21]
- Day 3
  - Regular Expressions[22]
  - RegEx -> NFA
- Day 4
  - Nonregular languages and the Pumping Lemma[23]
  - Assignment 4[24]
  - Catching up

[14] notes/fin_aut_dfa.html
[15] notes/ocaml_dfa.html
[16] notes/fin_aut_dfa.html
[17] notes/fin_aut_dfa.html
[18] notes/ocaml_dfa.html
[19] assignments/3.html
[20] notes/fin_aut_nfas.html
[21] notes/fin_aut_nfas.html
[22] notes/regexp.html
[23] notes/nonregular.html
[24] assignments/4.html

Week 5 (10/05-10/09)

- Day 1
  - Lexers[25]
- Day 2
  - Review
- Day 3
  - Midterm 1 (study guide[26])
- Day 4
  - Context Free Grammars[27]
  - Examples of derivations
  - Ambiguous grammars

Week 6 (10/12-10/16)

- Day 1
  - Programming examples of CFGs
  - Chomsky Normal Forms[28]
- Day 2
  - Pushdown Automata definition[29]
- Day 3
  - PDAs more examples
- Day 4
  - CFG -> PDA[30]

Week 7 (10/19-10/23)

- Day 1
  - Fall Break
- Day 2

[25] notes/lexers.html
[26] notes/midterm1_study_guide.html
[27] notes/cfg.html
[28] notes/cfg.html
[29] notes/pushdown_automata.html
[30] notes/cfg_pda.html

  - Pumping lemma for CFGs[31]
  - Non-context-free grammars
- Day 3
  - Basics of Parsing, First/Follow sets[32]
- Day 4
  - Basics of Parsing, First/Follow sets[33]
  - Assignment 5[34]

Week 8 (10/26-10/30)

- Day 1
  - Basics of Parsing, LL(k) parsers[35]
- Day 2
  - Basics of Parsing, LR(k) parsers[36]
- Day 3
  - Basics of Parsing, LR(k) parsers[37]
- Day 4
  - Turing Machines[38]
  - Assignment 6[39]

Week 9 (11/02-11/06)

- Day 1
  - Turing Machines, examples[40]
- Day 2
  - Multitape / Nondeterministic Turing machines[41]
- Day 3

[31] notes/pumping_cfg.html
[32] notes/parsing.html
[33] notes/parsing.html
[34] assignments/5.html
[35] notes/parsing.html
[36] notes/parsing.html
[37] notes/parsing.html
[38] notes/turing.html
[39] assignments/6.html
[40] notes/turing.html
[41] notes/turing.html

  - Multitape / Nondeterministic Turing machines[42]

- Day 4
  - Decidable Problems, Regular Languages[43]
  - Assignment 7[44]

Week 10 (11/09-11/13)

- Day 1
  - Decidable Problems, CFLs[45]
- Day 2
  - Catching up
- Day 3
  - Midterm 2 (study guide[46])
- Day 4
  - The Halting Problem[47]

Week 11 (11/16-11/20)

- Day 1
  - Assignment 8[48]
  - The Halting Problem[49]
- Day 2
  - The Halting Problem (cont)[50]
- Day 3
  - Reducibility[51]
- Day 4
  - Mapping Reducibility[52]

[42] notes/turing.html
[43] notes/decidable.html
[44] assignments/7.html
[45] notes/decidable.html
[46] notes/midterm2_study_guide.html
[47] notes/halting.html
[48] assignments/8.html
[49] notes/halting.html
[50] notes/halting.html
[51] notes/reducibility.html
[52] notes/mapping_reducibility.html

Week 12 (11/23-11/27)

- Day 1
  - Mapping Reducibility (cont)[53]
- Day 2
  - Thanksgiving Break
- Day 3
  - Thanksgiving Break
- Day 4
  - Thanksgiving Break

Week 13 (12/01-12/04)

- Day 1
  - Assignment 9[54]
  - Time Complexity[55]
- Day 2
  - Time Complexity for different Models[56]
- Day 3
  - The P and NP classes. P[57]
- Day 4
  - Assignment 10[58]
  - The P and NP classes. NP[59]

Week 14 (12/07-12/11)

- Day 1
  - NP-complete problems[60]
- Day 2

[53] notes/mapping_reducibility.html
[54] assignments/9.html
[55] notes/time_complexity.html
[56] notes/time_complexity.html
[57] notes/p_vs_np.html
[58] assignments/10.html
[59] notes/p_vs_np.html
[60] notes/np_complete.html

  - The Cook-Levin Theorem[61]

- Day 3
  - More NP-complete problems[62]
- Day 4
  - Review. Final study guide[63]

[61] notes/np_complete.html
[62] notes/np_complete.html
[63] notes/midterm3_study_guide.html